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Notes on the palm collections.

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One important aim of the expedition was to build up a comprehensive reference collection of palm trees that could serve as the base for a future treatment of the family for Flora of Thailand. Palms indeed represent a difficult group for taxonomic studies. Their bulky and often spiny nature has meant that general plant collectors tend to avoid them. The making of good herbarium specimens of palms is a laborious and time-consuming process. Not only are palms under-represented in most herbaria, but specimens of this group are often inadequate and lack important information. Under the expedition palms were collected according to the guidelines provided by Dransfield (1986) whenever time and the material permitted. Besides dried material, the collections also include photographs (both colour slides and black and white), pickled material (fixed in either Navashin's solution or 30% formalin), samples of pollen grains for germination and cytological studies, and dried samples of bulky structures. The souther provinces in Thailand have the highest diversity of palm species. Another aim of the expedition was to estimate endemism and conservation status of some palms. We further wanted to find suitable sites for future studies of the reproductive biology of selected species.

For almost a decade, I have been a student of South American palms and my field work has been concentrated in Colombia, Ecuador, Peru, and Panama. The expedition to peninsular Thailand gave me a chance to compare the palm flora of Tropical SE Asia with that of the north-western part of South America.

In the western part of the Amazon Basin, the dynamic nature of the forest communities has a strong impact on gene flow and evolution within and between populations. Speciation processes are not always clear and this often causes many frustrations for the evolutionarily oriented taxonomist. The ever changing courses of the rivers result in mosaics of differently aged forest successions often with high turnover rates among the trees.

From the limited experience I gained collecting palms for two month in southern Thailand I would say that species of palms not are more clear in their circumscription than in the upper Amazon. It would be interesting to see whether this is a general trend. Do the major speciation processes differ and in which way? It is interesting to note that complexes of sympatric species are quite common among the understory palms in Asia e.g. *Pinanga* and *Licuala*. One major historical biogeographical difference between South America and Tropical SE Asia is the effect of the Pleistocene climatic changes. In South America the differents peiods of glaciation have had a profound impact on climate, and distribution of many organisms. The Pleistocene climatic fluctuation must have been less dramatic in Tropical SE Asia and caused much less turbulence in the biotic environment. The forest apparently did not retreat into more or less well defined refugia as it has been demonstrated in South America.

One of the facts that results from a comparison between the palm flora in South America and that of Tropical SE Asia are the parallels in life forms. One of the most striking examples is the very similar life form of *Eleiodoxa conferta* (Griff.) Burret growing in freshwater swamp-forest on the Malay peninsula and *Astrocaryum murumuru* Mart. growing in periodically flooded riverine forests along the upper tributaries of the Amazon river. They both tend to dominate their habitat. The two species represent two different evolutionary tendencies within the palms. The similarities are not confined to the vegetative parts but are also present in the inflorescence structure. We should always bear such cases in mind when constructing phylogenies relying on vegetative characters e.g., spines or stem architecture. One of the most striking differences between the two continents is naturally the dominance in Asia of the rattans, but even this lifeform is somewhat parallelled by the neotropical genus *Desmoncus* although this is much less common. Another difference between the palm floras in South America and Tropical SE Asia, respectively, seems to be a higher proportion of narrow endemics and niche specialist in the latter part of the world.

Niche specialists are important as ecological indicators especially when they constitute a dominating element in the forest. This applies to species

belonging to genera such as *Licuala, Phoenix, Nypa,* and *Eleiodoxa.* In the Amazon adaptation to particular kinds of habitats has often been demonstrated at the subspecific level.

During the eight weeks campaign over 90 collections of palms were made. Naming at the specific level has not yet been completed. The following list gives the genera collected with number of species (preliminary) and number of specimens in parentheses: *Areca L.* (1/2), *Arenga* Labillardière in DC. (4/12), *Borassodendron* Beccari (1/1), *Borassus* L. (1/1), *Calamus* L. (4-6/12) *Caryota* L. (1/2), *Cyrtostachys* Blume (1/3), *Daemonorops* Blume (2/3), *Eleiodoxa* (Beccari) Burret (1/1), *Iguanura* Blume (3/7), *Korthalsia* Blume (1/2), *Licuala* Thunb. (4-5/12), *Livistona* R. Brown (3/6), *Maxburretia* Furtado (1/1), *Nenga* H.A. Wendl. & Drude (2-3/4), *Nypa* Wurmb (1/3), *Oncosperma* Blume (2/4), *Orania* Zipp. in Blume (1/2), *Phoenix* L. (2/5), *Pinanga* Blume (3-4/9), *Salacca* Reinwardt (2-3/4). Some of the cultivated palms were collected for studies of aspects of floral morphology: *Latania loddigisii* Mart., *Livistona chinensis* R. Brown, *Licuala grandis* H. A. Wendl., *Chrysalidocarpus lutescens* H. A. Wendl., *Raphis excelsa* (Thunb.) Henry, *Veitchia merillii* (Beccari) H. E. Moore, *Ptychosperma macarthurii* (H. A. Wendl.) Nicholson. Notes were made on economically important palms such as *Cocos nucifera* L., *Borassus flabellifer* L., *Metroxylon sagu* Rottboell, *Corypha umbraculifera* L., *Oncosperma horridum* (Griff.) Scheff., *Oncosperma tigillarium* (Jack) Ridl., *Nypa fruticans* Wurmb., *Arenga westerhautii* Griff. Also in the future, we intend to make observations on all uses of Thai palms. In that connection we would be very grateful to hear about minor uses of palms that we are not likely to have come upon.

A number of localities that we visited during the expedition are very interesting from a palmologist point of view and there is much more work to be done there. The future may not bring us any new species but we may learn much more about little known species such as *Kerriodoxa elegans* Dransfield. Some of the most promising localities for palms were alphabetically: Chio Lan Dam, Khao Chong, Tha Mot, and Toh Daeng. The fact that there is now a serious effort to treat the palms for Flora of Thailand should not prevent any botanist for working with this fascinating group, so important in both

an economical and an ecological sense. We know very little about reproduction biology of palms and I would strongly encourage work in this area in the future. We need basic information on pollination, predation, reproduction strategies, seed dispersal, population sociology, and the amount of interspecific variation.

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